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09/604,964	06/28/2000	Yasuo Suda	35.C14595	6373

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EXAMINER

SOLOMON, GARY L

ART UNIT PAPER NUMBER

2615

DATE MAILED: 01/20/2004

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/604,964

Applicant(s)

SUDA, YASUO

Examiner

Gary L Solomon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-28 and 30-32 is/are rejected.
- 7) ☒ Claim(s) 13 and 29 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: Examiner recommends that Baiyer be changed to Bayer in the disclosure.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over May (US 51587,820) in further view of Motta (US 5,565,914).

For claim 1, May discloses, an image pickup apparatus comprising:

a plurality of image pickup portions for receiving different wavelength components of object light; and a plurality of optical systems for guiding the object light to said plurality of image pickup portions (Figure 10), respectively, **but lacks** each of said plurality of optical systems having a filtering function whose transmission factor becomes smaller as the distance.

However, in analogous art, Motta teaches a filtering function which the transmission factor (sensitivity) becomes smaller as distance from the optical axis (Y) becomes longer in Figure 8A.

May illustrates a filtering arrangement with micro lenses (Figure 8b and 10). However, May lacks explicit teaching in the transmission factor or spatial resolution.

Seemingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure a filtering pattern in the arrangement of May with the idea of the decreasing transmission factor with distance of Motta in order to increase resolution.

For claim 2, May and Motta disclose all the previous limitations and also inherently disclose wherein said different wavelength components of the object light are representative wavelengths of light of different spectral distributions, respectively. White light contains all the different wavelengths of light.

For claim 3, May and Motta disclose all the previous limitations and also disclose wherein one of said different spectral distributions is a spectral distribution including a peak wavelength of a luminosity factor. The peak luminosity factor is present in order for there to be a color of white light.

For claim 4, May and Motta disclose all the previous limitations and also disclose wherein one of said different wavelength components of the object light is included in a spectral distribution including a peak wavelength of a luminosity factor. The peak luminosity factor is present in order for there to be a color of white light.

For claim 5, May and Motta disclose all the previous limitations and also disclose wherein said different wavelength components are two different color components among red, green, and blue. The polarizing filter of May would contain all three colors.

For claim 6, May and Motta disclose all the previous limitations and also disclose wherein said plurality of optical systems comprise a filter for extracting said different wavelength components, respectively (May Column 4, Lines 14-26).

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For claim 7, May and Motta disclose all the previous limitations, and May teaches a micro-lens structure in Figures 8, 9, and 10, Element 34, that each of the plurality of image pickup elements makes up a single lens.

For claim 8, it is well known in the art that a lens is integrally formed of a resin material. May and Motta disclose all the previous limitations and since it is so well known to form lenses out of glass or resin material, it therefore would be obvious to do so at the time of the invention. Official Notice is given.

For claim 9, Motta and May disclose all the previous limitations, and May also discloses wherein a light-shielding layer provided between said integrally formed lens (Figure 13, Element 13).

For claim 10, May and Motta disclose all the previous limitations, but do not disclose wherein each of said plurality of optical systems comprises a single lens provided with an infrared radiation-cutting filter. However, it is well known the to employ an Infrared Radiation Cut Filter in an image sensing device in order to reduce the amount of heat absorbed by the sensor. Official Notice is given.

For claim 14, May and Motta disclose all the previous limitations, and Motta also discloses wherein said plurality of image pickup portions are integrally formed (Figure 2B; Column 3, Line 35).

For claim 15, Motta, and May disclose all the previous limitations, and May also discloses wherein said plurality of image pickup portions are formed in a plane shape (Figure 7).

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For claim 16, Motta, and May disclose all the previous limitations, and May also teaches a plurality of openings for taking in external light through said plurality of optical systems (May Column 4, Lines 14-26).

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over May (US 5,587,820) in view of Motta (US 5,565,914) in further view of Thompson (US 5,255,088).

For claim 11, Motta disclose all the previous limitations, but lack teaching wherein each of the said plurality of optical systems comprises photo chromic glass. However, Thompson teaches a filtering arrangement in which photo chromic glass is used (Figure 2, Element 64).

The photochromic glass responds to light above short wavelength blue and into near ultraviolet, becoming darker or more opaque when exposed to UV light and clearer or more transparent when not exposed to UV light. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure the obvious combination of May and Motta with photochromic glass in order to allow for better exposure in extremely bright or dark conditions.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over May (US 5,587,820) in view of Motta (US 5,565,914) in further view of Nakanishi (US 6,157,420).

For claim 12, May and Motta disclose all the previous limitations, but lack teaching wherein each of the said plurality of optical systems comprises a color purity correction filter. However, Nakanishi teaches the use of color purity correction filters in Figures 6A-6C and Column 12, Lines 20-22. The filters are required color correction of color purity and are well known in the art.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to configure color purity correction filters with the obvious combination of May and Motts in order to correct and purify colors.

6. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over May (US 5,587,820) in view of Motta (US 5,565,914) in further view of Lewis (US 4028725).

For claim 17, May and Motta teach the limitations that existed in Claim 1. However, they fail to teach the optical systems not having a filtering function whose transmission factor becomes smaller as the distance from the an optical axis becomes longer.

Nevertheless, Lewis teaches the idea of using high resolution on the main portion of the image in order to enhance the region of interest for the viewer. The use of non-filters in a lens for in order to obtain a better image is a tradeoff for resolution. One would use a filter to enhance resolution and not use a filter to enhance the signal. Lewis teaches this In Column 4, Lines 18-25.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the in invention to combine the teaching of Lewis with the obvious variation of May and Motta in order to effectively minimize the loss of light energy through different color spectrum.

For claims 18-26, rejections for claims 2-10 apply.

For claim 27, rejection for claim 11 applies.

For claim 28, rejection for claim 12 applies.

For claims 30-32, rejections for claims 14-16 apply.

Allowable Subject Matter

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7. Claims 13 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to teach the following limitations as recited in claims 13 and 29: when a virtual object distance D [m] is defined as a function of an image pickup angle θ [°] of said plurality of optical systems to be $D = 1.4/\tan(\theta/2)$, an interval between the optical axes of said plurality of optical systems is set such that change in an interval between an object image received by one of said plurality of image pickup portions and an object image received by another of said plurality of image pickup portions between when an object is at said virtual distance and when the object is at infinity is smaller than a pixel pitch of said image pickup portions multiplied by two.

Conclusion

9. Further pertinent prior art can be found in the Notice of References Cited (892).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary L Solomon whose telephone number is (703)-305-4370.

11. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, Vu Le can be reached on (703)-308-6613.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

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Or faxed to:

(703) 872-9314, (for informal or draft communications, please label
"Proposed" or "Draft")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be
directed to the customer service number **(703) 306-0377**.



January 12, 2004



**ANDREW CHRISTENSEN
SUPERVISORY PATENT EXAMINER
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